11. The system of claim 1, further including an actuator for activating the switching device and wherein the actuator is a heat pulse generator.

12. The system of claim 1, wherein the switching device is integrally provided on the particle processing component substrate and is configured for an external actuator to operatively engage and activate the switching device.

13. The system of claim 1, wherein the switching device is configured to direct the selected particle out of the fluidic stream of particles without generating a pressure wave that travels upstream of the switching device.

14. The system of claim 1, wherein the fluidic stream of particles maintains a laminar flow when the selected particle is displaced and separated from the fluidic stream of particles.

15. A microfluidic method for producing a particle product from a sample having particles, the method comprising:

flowing the sample as a fluidic stream of particles from an upstream inlet along a first flow path through a first microfluidic flow channel formed in a substrate of a microfluidic particle processing component;

processing the sample on a particle-by-particle basis to produce a particle product;

outputting a first portion of the processed sample via a first downstream outlet of the first microfluidic flow channel; and

outputting a second portion of the processed sample via a second downstream outlet of the first microfluidic flow channel,

wherein the step of processing includes:

activating a switch component;

redirecting a single selected particle out of the first flow path of the fluidic stream of particles at a switching region and into a second flow path flowing downstream into the second downstream outlet, and

deactivating the switch component,

wherein activating the switch component does not generate a pressure wave that travels upstream to the switching region,

wherein activating the switch component does not shift the remainder of the fluidic stream of unselected particles from the first flow path flowing downstream into the first downstream outlet, and

wherein activating the switch component includes using an actuator external to and operatively associated with the microfluidic particle processing component, to activate the switch component; and

further comprising using a reservoir operatively associated with the first microfluidic flow channel to dampen or absorb a transient pressure pulse propagated across the microfluidic channel.

16. The method of claim 15, wherein the step of processing further includes using a reservoir operatively associated with the first microfluidic flow channel to originate the transient pressure pulse propagated across the first microfluidic flow channel for sorting particles on a particle-by-particle basis into the second downstream outlet.

17. The method of claim 15, wherein activating the switch component includes flexing the switch component.

18. The method of claim 15, wherein the switch component is located in a side channel and wherein the side channel is not a flow through channel.

19. A microfluidic system for sorting particles, the microfluidic system comprising:

a first microfluidic flow channel formed in a particle processing component substrate having an upstream inlet configured to introduce a fluidic stream having a plurality of particles into the first microfluidic flow channel and downstream outlets configured to output portions of the fluidic stream of particles;

a detection region located downstream of the inlet, the detection region configured to allow a particle having a predetermined characteristic to be sensed, the sensed particle being one of the plurality of particles in the fluidic stream;

a switching device located downstream of the detection region, the switching device operatively coupled to the first microfluidic flow channel to deliver a transient pressure pulse in a direction substantially perpendicular to a flow direction of the fluidic stream of particles,

wherein the transient pressure pulse displaces and separates a selected single sensed particle from the fluidic stream of particles,

wherein the selected particle is displaced and separated from the fluidic stream of particles in a switching region,

wherein the fluidic stream of unselected particles flows into a first downstream outlet configured to output a first portion of the fluidic stream of particles,

wherein the selected particle flows into a second downstream outlet configured to output a second portion of the fluidic stream of particles,

wherein the transient pressure pulse is not generated downstream of the switching region, and

further including an actuator for activating the switching device and wherein the actuator is a piezoelectric actuator,

wherein the particle processing component substrate includes a reservoir adapted for dampening or absorbing the transient pressure pulse propagated across the microfluidic channel.

20. The system of claim 19, wherein the particle processing component substrate includes a reservoir operatively associated with the switching device and adapted for originating the transient pressure pulse.

21. The system of claim 19, wherein the switching device further includes first and second side channels in fluid communication with the first microfluidic flow channel, the second side channel positioned opposite to the first side channel.

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